

Follow the steps below to make your own squishy circuit!
This is a beginner-friendly activity for ages 5 and older.

Supplies:

- Conductive dough (color)
- Insulating dough (white)
- Battery + battery holder
- LEDs, fans + motor, on/off switch, buzzer

Step 1: Pick a Project Card

Look at the project cards.
Pick an option to create.



Step 2: Gather Dough



Conductive



Insulating

Follow the instructions on the chosen card.
Be sure to not mix doughs. White is insulating. Color is conductive. Grab a pinch of each dough.

Step 3: Build circuit



Follow the instructions on your card to build a circuit.
Replace doughs in original containers when done.
Repeat with another card!

Curious how to make your own conductive and insulating dough?
See the back for instructions.

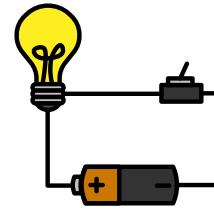


MakerSpace



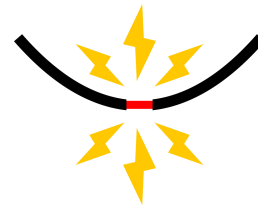
Circuit

The path in which electrical currents flow. A completed circuit takes the form of a circle.



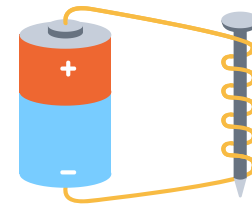
Short Circuit

An electrical circuit in which a path of very low resistance has been created.



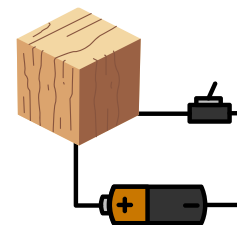
Conductor

A material or object that allows electrical current to easily flow through it. Salt is conductive in the dough.



Insulator

A material or object that does not allow electrical current to easily flow through it.



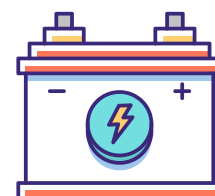
LED

A light-emitting diode or LED is a semiconductor device that emits visible light when an electric current passes through it.



Terminal

A conductive surface that provides an electrical connection point.



Making Insulating Dough



Ingredients

- 1½ Cup (355 mL) Flour
- ½ Cup (118 mL) Sugar
- 3 Tbsp. (44mL) Vegetable Oil
- ½ Cup (118 mL) Deionized Water

(Note: distilled or regular tap water can be used, but the resistance of the dough will be lower)

Insulators do not allow electricity to easily pass through them. **Resistance** is a measurement of how insulating something is.

This dough is resistive which means little electricity can flow through it.

Instead of insulating dough, you can also try artist's clay, which is highly resistive.



Step 1:

Set aside ½ cup flour to be used later. Mix remaining flour, sugar, and oil in a pot or large bowl.

Step 2:

Mix in a small amount (about 1 Tbsp.) of deionized water, stirring until the water is absorbed.

Repeat this step until large, sandy lumps begin to form.



Making Insulating Dough



Step 3:

Turn the dough out onto a sheet tray or a floured countertop, gathering it into a single lump.

Step 4:

Add small increments of flour or water to yield a dough-like, pliable consistency.



Storage:

Keep the dough in a sealed container or bag for up to a week. For longer periods, the dough can be frozen.

While in storage, the oil may separate and the dough may lose its dough-like consistency. Simply add additional flour to remove the stickiness before using again.

Making Conductive Dough



Ingredients

1½ Cup (355 mL) Flour

1 Cup (237 mL) Water

¼ Cup (59 mL) Salt

3 Tbsp. (44 mL) Cream of Tartar*

1 Tbsp. (15 mL) Vegetable Oil

Optional: food coloring

* 9 Tbsp. (133 mL) of Lemon Juice may be substituted

Conductors allow electricity to pass through them.

In this recipe, the salt and water allow electricity to flow and bring your Squishy Circuit creations to life.

Many purchased doughs are salt based so they can be used (results may vary).



Step 1:

Mix water, 1 cup of flour, salt, cream of tartar, vegetable oil and food coloring (if using) in a medium-sized saucepan.

A non-stick pan works best.

Step 2:
Cook over medium heat, stirring continuously. The mixture will thicken, and lumps will begin to form.



Making Conductive Dough



Step 3:

Continue heating and stirring until the mixture forms a ball and pulls away cleanly from the sides of the saucepan.

Step 4:

Turn the dough out onto a floured surface. Use caution, as it is very hot at this point.



Step 5:

Allow the dough to cool for a few minutes before kneading flour into it until the desired consistency is reached.

Storage:

Keep the dough in a sealed container or bag for several weeks. For longer periods, the dough can also be frozen.

While in storage, water from the dough may create condensation inside the container; this is normal. Knead the dough after removing it from the storage container to refresh its pliability.

squishycircuits®

build instructions for:

Airplane

colors needed:



- 1 Create the wings by wrapping one of the tools in blue dough.



- 2 Make the landing gear by placing a portion of blue dough between the black tool kit end caps.



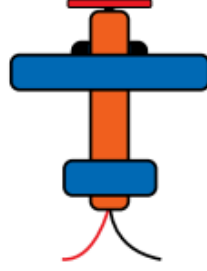
- 3 Create the tail portion for the plane with blue dough. This should be shorter than the main wing section.



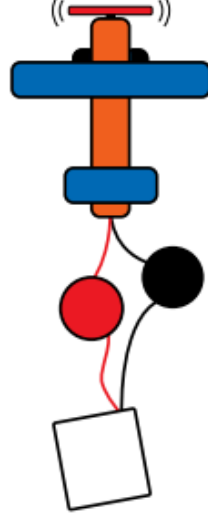
- 4 To make the body of the plane, wrap the fan motor with orange dough. Be sure that the wires hang out of the rear.



- 5 Attach the wings, tail section, and landing gear to the body of the plane.



- 6 Keep the circuits color-coordinated. Connect the red wires from both the plane and the battery container to the red ball of dough. Use the same process for the black wires and dough. Turn on the battery box to make the fan spin.

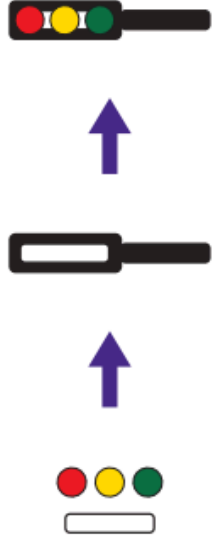




- 1 Begin by rolling out two pieces of black dough for the pole and base of the traffic light. Place the more rectangular piece above the thinner piece.



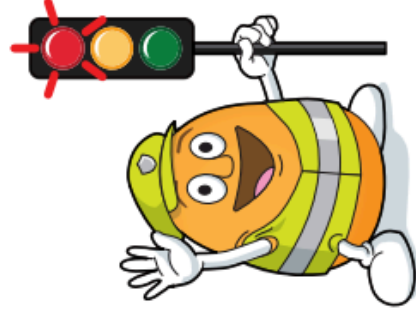
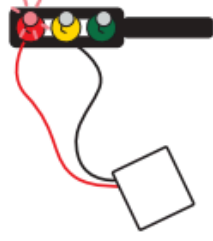
- 2 Next, place down a piece of white dough that is slightly smaller than the top piece of black dough. After that, place three colored circles of dough over the white dough. The colors should be in this order: red, yellow, and then green.



- 3 Attach the long legs of LEDs into the red, yellow, and green dough circles with the short legs going into the black dough. (Pro tip: make sure the long legs do not poke through the white dough and touch the black dough)



- 4 Finally, we bring in the battery holder to light up the traffic light. Attach the black wire to the black dough. To light up each of the LEDs, one at a time, touch the red wire to any of the red, yellow, or green dough circles and see that LED light up! You can even change which LED lights up by touching the red wire to one of the other colored dough circles.





1 Begin by forming a fire ring using white insulating dough.



2 Next, line the outside of the fire ring with small round pieces of black dough. These will be the rocks around your fire ring.



3 Create a thick disc shape, using red dough and place the disc inside of the white fire ring.



4 Using both the orange and red dough create the flame licks for inside the fire ring. Create three licks of both colors. Next, place the flame licks onto the red disc shape inside of the fire ring. Be sure to alternate the colors when placing.



5 Add in four LEDs to your fire. When inserting the terminals from the LEDs, be sure to have the long terminals inserted into the black dough. The short terminals will then be inserted into the red disc inside the fire ring.



6 Light up your fire by attaching the battery holder wires. Insert the red wire from the battery holder into one of the black dough pieces. Next, insert the black wire into the red disc inside the fire ring. Turn the power switch on the battery holder to "on" to light up the fire!

